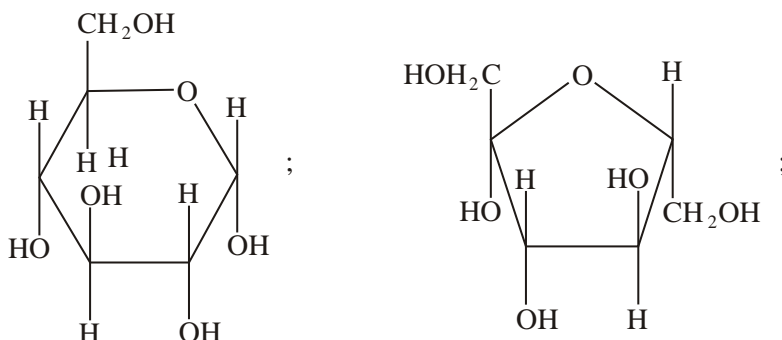


TBD06 – IB Question Review #3 MS

1. (a) both are polymers of glucose;
starch has two forms: amylose a straight chain polymer with \square 1, 4 linkages;
and amylopectin a branched polymer with \square 1, 4 and \square 1, 6 linkages;
cellulose has \square 1, 4 linkages; 4
- (b) absence of cellulase enzyme; 1
2. (a) plant material that is not hydrolysed by enzymes (secreted by the human digestive tract);
may be digested by microflora in the gut; 2
- (b) *Any two of the following:*
cellulose;
hemicellulose;
lignin;
pectin; 2 max
- (c) (may be helpful in the prevention of conditions/health problems such as)
Any two of the following:
diverticulosis;
irritable bowel syndrome;
constipation;
obesity;
Crohn's disease;
haemorrhoids;
diabetes mellitus; 2 max
3. (a) *vitamin C function*
collagen formation/production of connective tissue/enhances
absorption of iron (from food)/helps healing of wounds/can prevent
bacterial infection/antioxidant/bone or teeth formation;
effects of deficiency
scurbutus/scurvy;
vitamin D function
uptake of calcium/phosphorus/bone or teeth formation;
effects of deficiency
rickets; 4
- (b) *Any two of the following:*
providing food rations that are composed of fresh and vitamin-
and mineral-rich foods;
adding nutrients missing in commonly consumed foods;
genetic modification of foods;
providing nutritional supplements; 2 max
4. (a) glycosidic/glucoside/ether; 1
- (b)



2

Do not penalize candidates who draw bonds connected to the incorrect atom \square
 e.g. $\square\text{HO}$ instead of $\square\text{OH}$

- (c) CH_2O ; 1
5. (a) (testosterone)
 testes;
 development of male sex organs/characteristics/tissue/muscle/bone
 growth/anabolic effect;
OR
 (oestradiol)
 ovaries;
 ovulation/development of female sexual characteristics;
OR
 (progesterone)
 ovaries;
 prepares uterus for fertilized egg; 2
- (b) (adrenaline/epinephrine)
 adrenal glands;
 regulates body's preparation for stress/OWTTE;
OR
 (thyroxine)
 thyroid gland;
 regulates body's metabolism;
OR
 (Insulin)
 pancreas/Islets of Langerhans;
 Regulation of glucose concentration in bloodstream/regulates blood
 sugar levels; 2
6. (a) saturated have only single carbon to carbon/ $\text{C}-\text{C}$ bonds/unsaturated have
 double carbon to carbon/ $\text{C}=\text{C}$ bonds;
Do not award mark if no reference to carbon-carbon bonds.
 saturated have a straight hydrocarbon chain/unsaturated have a kinked
 hydrocarbon chain/OWTTE; 2
Accept bond angle of $109(5)^\circ$ in saturated and 120° in unsaturated.
- (b) chains pack closer together;
 stronger intermolecular forces/van der Waals' forces; 2
Accept London forces and dispersion forces in place of van der Waals' forces.
Do not accept stronger hydrogen bonding.
Award [0] if any reference to breaking carbon-carbon bonds.
7. (i) 2
- $$\begin{array}{ccccccc} \text{H}_2\text{N} & -\text{CH}_2- & \text{C} & -\text{N}- & \text{CH}- & \text{COOH} \\ & & \parallel & | & | \\ & & \text{O} & \text{H} & \text{CH}_2\text{OH} \end{array}$$
- OR**
- $$\begin{array}{ccccccc} & & \text{O} & \text{H} & & & \\ & & \parallel & | & & & \\ \text{H}_2\text{N} & -\text{CH}- & \text{C} & -\text{N}- & \text{CH}_2- & \text{COOH} \\ & | & & & & & \\ & \text{CH}_2\text{OH} & & & & & \end{array}$$
- Award [1] for peptide bonds correctly shown in full and a further [1] if rest of*

structure correct.

If peptide bond abbreviated, eg [CO[NH]] but structure otherwise correct, award [1].

- | | | | |
|------|---|---|------------|
| (ii) | condensation and water/H ₂ O; | 1 | |
| | | | [3] |
| 8. | chemical messengers;
pituitary (gland)/hypothalamus; | | |
| | | | [2] |
| 9. | (i) (warm with dilute) hydrochloric acid; to hydrolyse protein/to break it down into amino acids/to break the peptide bonds; | 2 | |
| | (ii) (mixture of) amino acids spotted on paper (and known amino acids spotted on paper);
water/solvent/eluent flows up/down paper;
amino acids separate because they have different solubilities in water/
solvent/eluent and/or different adsorption on paper;
amino acid positions identified/sprayed with ninhydrin/locating agent;
locations compared with known amino acids/R _f values compared; | 4 | |
| | | | [6] |